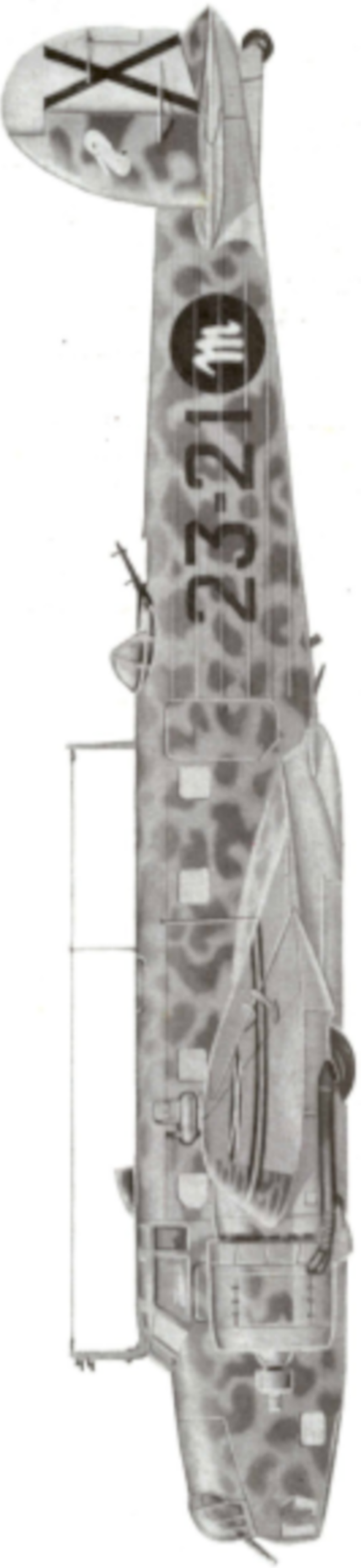
PROFILE
PUBLICATIONS

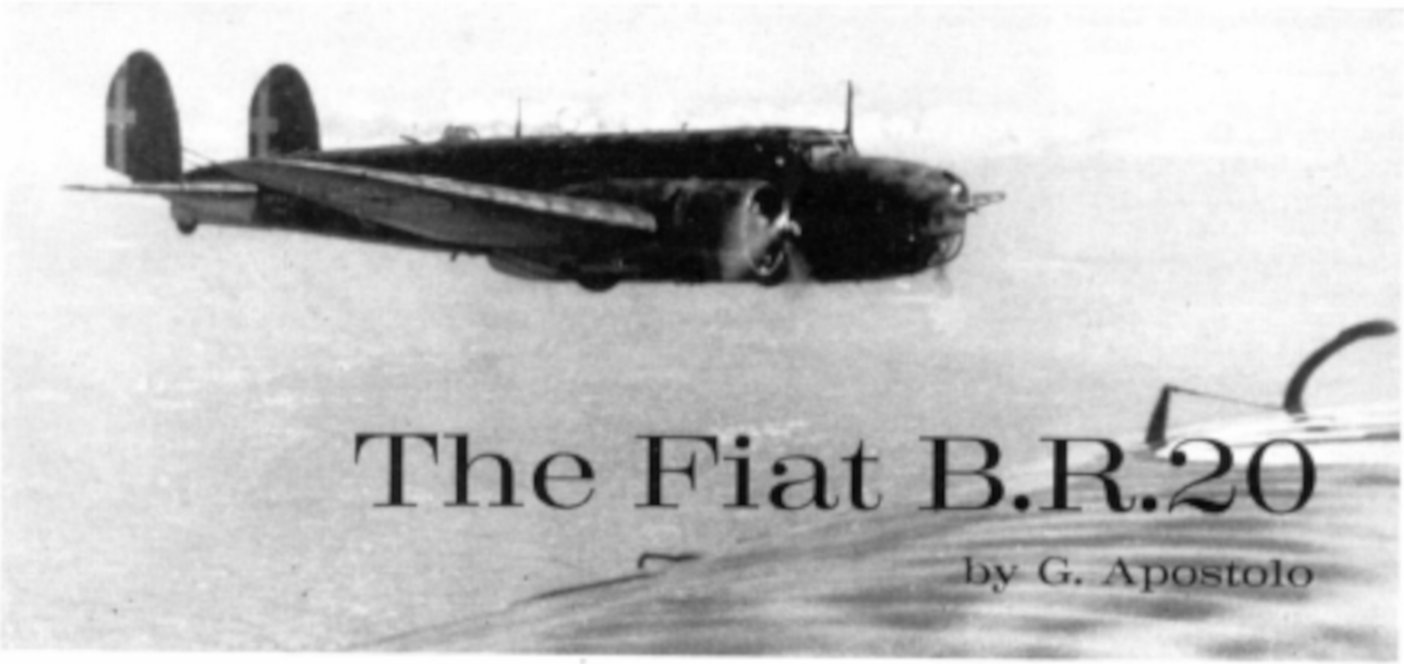
The
Fiat
B.R.20

NUMBER 110
TWO SHILLINGS



The Fiat B.R.20

by G. Apostolo



Fiat BR.20M in flight; note the improved nose configuration. This variant was introduced into service with the Regia Aeronautica *in the winter of 1939/1940.* (Photo: Col. Cesar Milani)

One of the lessons which was impressed on the powers involved in the Spanish Civil War was the importance of strategic bombing. From its earliest stages this conflict was a vital testing ground for the Italian, German, French, British, American and Russian equipment supplied to the two sides in that unhappy country; and 1936 was thus a vintage year for bomber development, many of the designs which appeared at that time being destined to play important rôles in the world war which was to spread across the globe four years later.

In Italy, the Fiat company strove to utilize its background experience to build a light bomber of relatively high speed and a simple, rugged construction. The design was completed with remarkable rapidity and the aircraft, designated BR.20 *Cicogna* (Stork), achieved production status in a very short time. The *Cicogna* never won the fame which obtains to its main contemporaries such as the Junkers Ju 88 and the Vickers Wellington, and this was due mainly to certain negative elements in the design, and in particular, in the propulsion system.

When it appeared in 1936 the BR.20 was regarded as a modern concept especially suitable to replace, with the famous S.M.79 (see *Profile* No. 89, *The Savoia Marchetti S.M.79*) the ageing S.M.81 *Pipistrello* bomber. It represented a departure from the line of aircraft previously designed by Ing. Celestino Rosatelli, and in the BR.20 are to be found several elements of the twin engined commercial transport flown by Fiat in 1935 under the designation A.P.R.2.

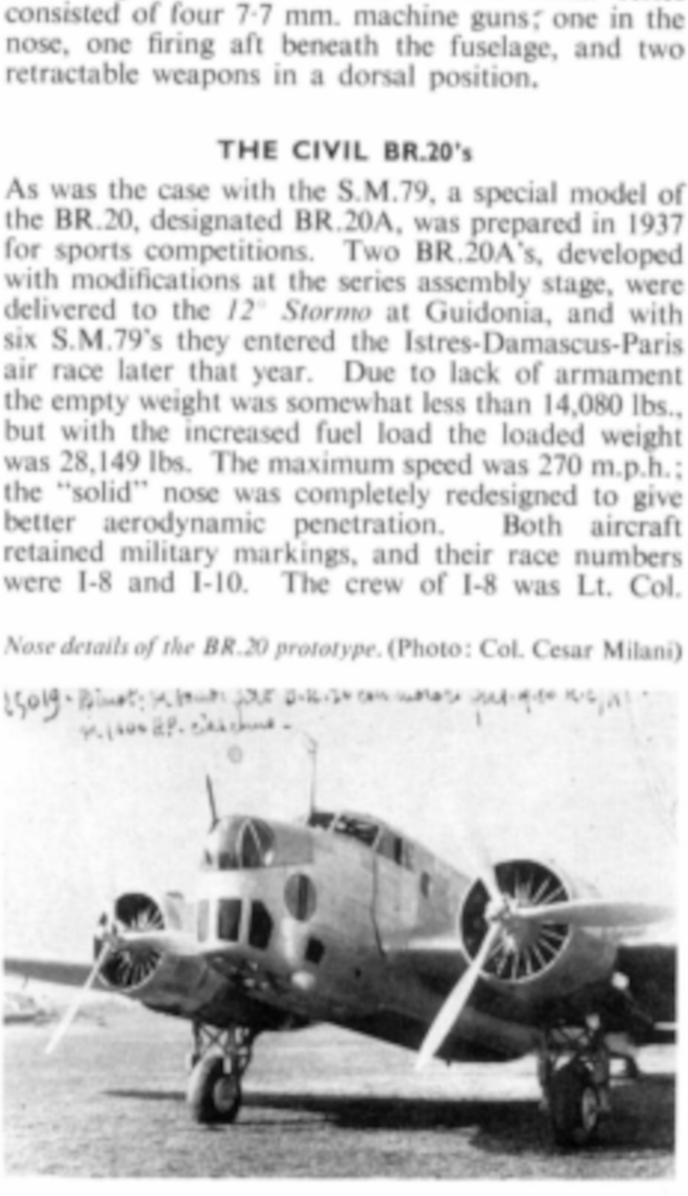
The *Cicogna* prototype flew at Turin on February 10th 1936, with the Fiat test pilot Rolandi at the controls; and was subsequently transferred to Guidonia for a fast evaluation programme. Production was immediately authorised by the *Regia Aeronautica*, and in September 1936 the first BR.20 was delivered to the 13° *Stormo Bombardamento Terrestre* at Lonate Pozzolo airfield. A second unit was equipped on the same air base, the 7° *Stormo B.T.*, which by February 1937 had 18 BR.20's on charge. To test the new type under tropical conditions a machine was delivered in June 1937 to the *14° Stormo* at Benghazi, and two more to the *15° Stormo* at Castel Benito in Tripoli. The radial engines had already begun to give trouble and their use under desert conditions did nothing to improve their efficiency.

The first 100 production machines differed from the prototype in many details of nose, fuselage and tail design. The armament of this initial series consisted of four 7·7 mm. machine guns; one in the nose, one firing aft beneath the fuselage, and two retractable weapons in a dorsal position.

THE CIVIL BR.20's

As was the case with the S.M.79, a special model of the BR.20, designated BR.20A, was prepared in 1937 for sports competitions. Two BR.20A's, developed with modifications at the series assembly stage, were delivered to the *12° Stormo* at Guidonia, and with six S.M.79's they entered the Istres-Damascus-Paris air race later that year. Due to lack of armament the empty weight was somewhat less than 14,080 lbs., but with the increased fuel load the loaded weight was 28,149 lbs. The maximum speed was 270 m.p.h.; the "solid" nose was completely redesigned to give better aerodynamic penetration. Both aircraft retained military markings, and their race numbers were I-8 and I-10. The crew of I-8 was Lt. Col.

Nose details of the BR.20 prototype. (Photo: Col. Cesar Milani)



The dictator Mussolini passes an early BR.20 during a Regia Aeronautica *inspection.*

Rolandi, Lt. Col. Bonini and Ass. Rossi; while I-10 was piloted by Lt. Col. Gaeta with Lt. Col. Questa, Lt. Zoppi and Sgt. Bordoni as crew. The first leg of the race from Istres to Damascus was flown by the BR.20's at 385-400 km/h.

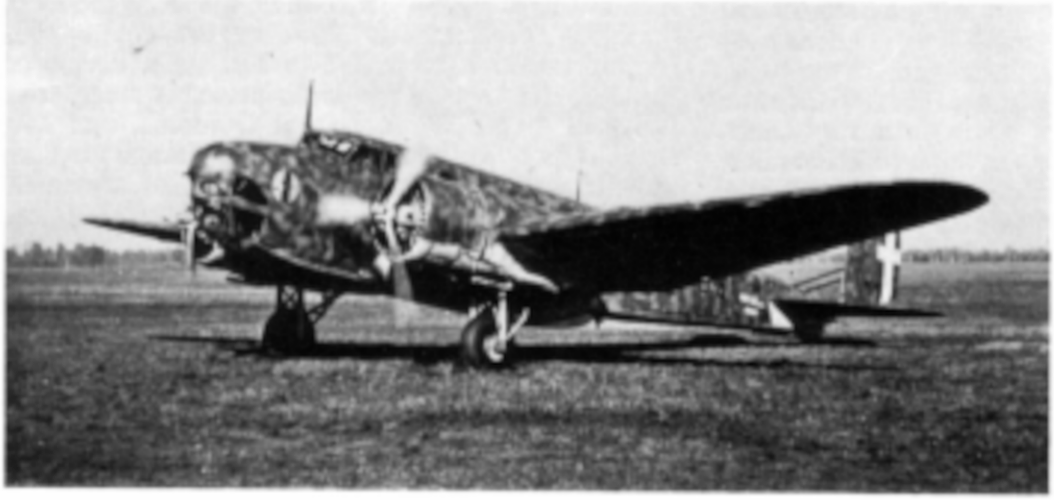
Another civil variant, the BR.20L, appeared in 1939. Named "Santo Francesco", and crewed by Maner Lualdi, Giuseppe Mazzotti and Ettore Valenti, it flew the 2,773 miles between Guidonia and Addis-Ababa non-stop in 11 hours 25 minutes, on March 6th-7th 1939. The average speed was 250·3 m.p.h., with a limited cargo shipment made up of copies of two leading daily papers of the time, *Il Popolo d'Italia* and *La Stampa*. The BR.20L tested for the first time a new autopilot developed by Microtecnica. It is also worth noting that the proving flight made a few weeks previously ended in an emergency landing at Beirut. Only one BR.20L was built.

THE BR.20 DESCRIBED

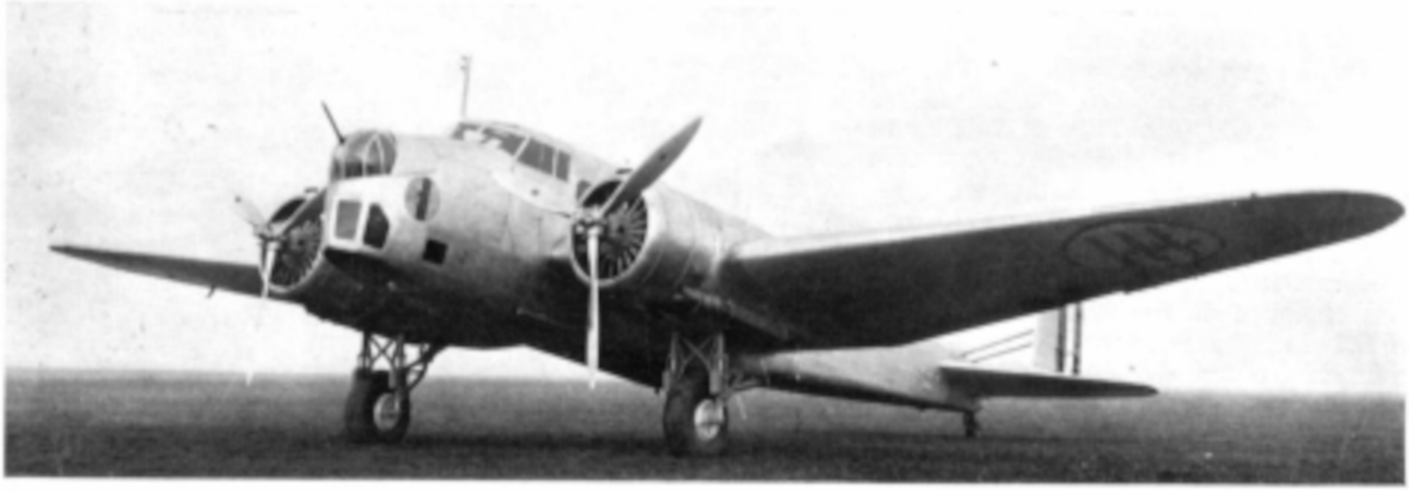
The BR.20 was a low-wing cantilever monoplane, twin-engined, of metal construction with a limited amount of fabric covering.

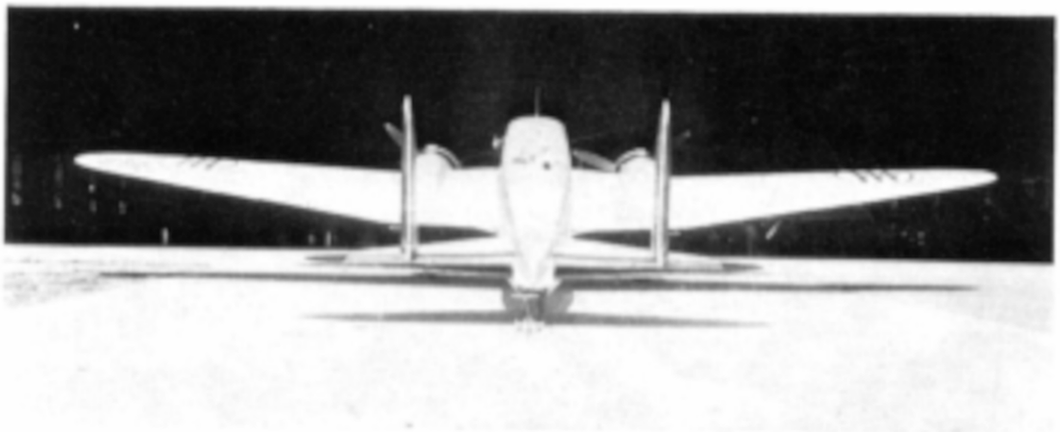
The wing was built in three sections; centre section integral with the fuselage, and two tapering outer sections. The centre section was built on two double-I section duralumin spars with a maximum chord of 17 feet, and carried the engine nacelles, fuel tanks (between nacelles and fuselage) and landing gear. Most of the attachments were of pressed steel. Split flaps, Zipp type, were provided between the ailerons and fuselage.

The main structure of the fuselage, a rectangular section with rounded corners, was made in three main sections with welded steel tube. The forward section contained the nose gun position, the centre section the cockpit and bomb bay. The pilot's cockpit was ahead of the wing leading edge, with the radio operator's position immediately behind it. The entrance door was on the port side at the trailing edge of the wing and emergency exits were provided in roof and floor. The nose, containing the forward



A BR.20M of the 8° Squadriglia, 25° Gruppo; July 1941. (Photo: the author)





Rear view of the prototype Cicogna.
(Photo: the author)

gunner's and bombardier's positions, was of light metal construction.

The bomb bay was isolated from the rest of the aircraft by an aluminium sheet. Both aft gun mountings were retractable; one 12·7 mm. gun was installed in a hydraulically operated retractable dorsal turret amidships, and one 7·7 mm. weapon fired to the rear under the fuselage from a mounting above a retractable tray. The nose gun was of 7·7 mm. calibre. In the initial series the duralumin skinning covered 565·1 sq. ft., with 144·2 sq. ft. of fabric; in the BR.20M the duralumin was extended to cover 753·47 sq. ft. The tail unit of the BR.20 was of the cantilever monoplane type with twin fins and rudders, the fins being braced to the fuselage; the structure was metal with part duralumin and part fabric skinning. The control surfaces were statically and dynamically balanced, with controllable trimming tabs.

The main landing gear had independent units with oleo shock absorbers and two rear-inclined retracting struts. The wheels retracted backwards into the aft section of each nacelle; retraction was hydraulic.

The bomb bay could accommodate a total of 1,600 kg. of bombs (2 × 800 kg., or 2 × 500 kg. and 4 × 250 kg., or a variety of other combinations), stowed horizontally and released by a bleed air device controlled from the right hand side of the bombardier's position. The bomb-sight was the Jozza G.3, standard on several types of Italian bombers. The radio equipment included an R.A.5301 transmitter, an A.R.5 receiver and a P.3N radio-compass with route indicator.

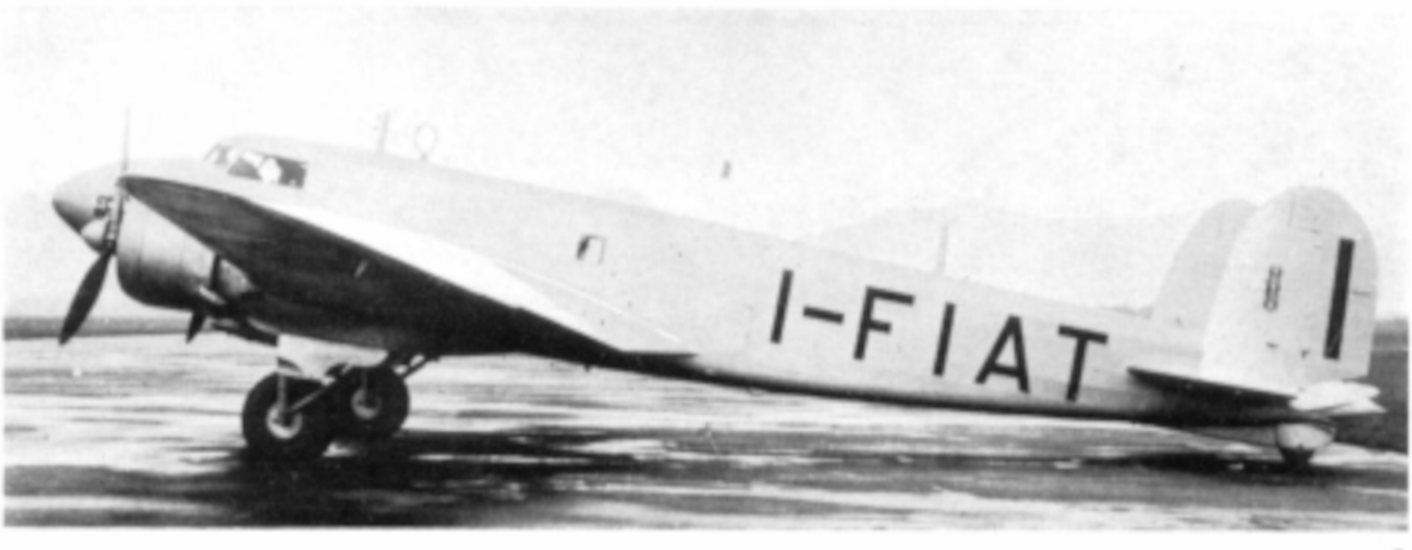
The engines of the initial model were two Fiat A.80RC.41 eighteen cylinder air-cooled radials each rated at 1,000 h.p. at 13,450 ft. and 2,100 r.p.m., driving three-bladed Fiat-Hamilton constant-speed propellers. The A.80 powerplants were retained on the later M-series aircraft; maximum and normal cruising speeds remained identical on both aircraft, 267 and 211 m.p.h. respectively, but range was reduced from 1,865 to 1,243 miles and service ceiling from 23,620 ft. to 22,145 ft. Overall wing span and area were identical for both models at 70 ft. 8 in. and 796·529 sq. ft. but the overall length of the BR.20M was 55 ft. ¾ in. as compared to 52 ft. 9 in. on the original model. Empty and loaded weights were increased in the later model from 14,330 lb. and 22,266 lb. to 15,102 lb. and 23,038 lb.

THE BR.20 IN SPAIN

Six BR.20's from the *7°* and *13° Stormi* took off from Guidonia early in the summer of 1937 and landed at Tablada, near Seville. Here they formed the *230° Squadriglia Bombardamento Veloce* into the *29° Gruppo*. On September 4th the unit was transferred to Soria and on November 15th the *230° Squadriglia* formed the *35° Gruppo Autonomo* of the *Aviazione Legionaria*.

The new operational squadron began its activity on November 26th at Tudela airfield. The bombers were supported by four Breda 65's of the *65° Squadriglia Assalto*. Camouflaged with a mottling of green over a sand-yellow background, the BR.20's carried the number 23 and two identification numbers, from 21 to 26. (See the five-aspect painting on the centre pages of this *Profile*.) The new bombers operated daily against Republican targets, usually without fighter escort. At their operational altitude of 13,000 feet the A.80 engines were efficient, and the Russian I-15 interceptor biplanes posed no real threat. In April 1938 they operated over the Ebro front; and in July, after being transferred to Puig Moreno, they were used for the first time in the photo reconnaissance rôle, owing to the accuracy and excellent resolution of the A.G.R.61 camera installed.

The sole BR.20L, which made the record flight from Guidonia to Addis-Ababa on March 6th-7th 1939.



Nose details of the BR.20L, "Santo Francesco."

Santo Francesco

The BR. 20 proved itself as a fast and rugged aircraft during these operations, and only one plane was lost during a take-off from Tedula airfield. In July 1938 seven more BR.20's arrived from Viterbo to supplement the unit, and the *35° Gruppo* was reformed into two *Squadriglie*, the *230°* and *231°*, with six aircraft each. The new machines operated alongside the early versions, and mounted a 12·7 mm. gun in a retractable dorsal turret. The first group mission was against Viver, with ten machines participating. Both *Squadriglie* then moved to Valenzuela where Major Rampelli took command of the *Gruppo*. As the war drew to a close, the BR.20's flew their last mission, against Toledo.

THE JAPANESE BR.20

While their bomb load was not particularly large, the BR.20's record of speed and ruggedness earned in Spain caught the attention of overseas observers. At that time the Japanese government, after evaluating both the Caproni 135 and the BR.20 for operations with the I.J.A.A.F. in China, signed a contract with Fiat for the supply of 75 BR.20's with engines and spare parts for the astronomical figure of 182,000,000 lire, to which may be added a further 25,000,000 for ten additional machines delivered to Japan the following year.

The first Japanese BR.20's were shipped to Talien early in 1938 and sent to Chushuitzu for assembly and flight testing. From there they were flown to China and commenced operations, supporting the old Mitsubishi 93 bombers of the Japanese Army Air Force. However, the BR.20's, designated Type I (for Italy) Model 100 (allied code name Ruth) were reported to be unpopular with their Japanese crews, who considered them poorly armed and easily susceptible to enemy fire. This may not in fact be true, as the BR.20's had a metal-skinned wing and not fabric covering as claimed in the Japanese Press at the time. The BR.20's were gradually phased out of service when deliveries of the Type 97 Mitsubishi commenced.

The only other export sale was one machine bought in 1938 by Venezuela after the visit of a Venezuelan military mission to Italy.

THE BR.20 IN THE SECOND WORLD WAR

When Italy entered the Second World War the BR.20 equipped four *Stormi Bombardamento Terrestre*. At the end of 1939 the first prototype BR.20M was completed; this version (M for Modified) embodied some external improvements leading from experience in the Spanish Civil War. With the same A.80RC.41 engines, the M-variant had a longer fuselage with an aerodynamically cleaner nose and a new defensive position. The wing, dimensionally unchanged, was strengthened to withstand the high vibration of the powerplants. When the M-variant entered service the early models were progressively modified to the

One of the two BR.20A's built for competitive flying, during the early stages of the trials programme. (Photo: via the author)

A Japanese Army Air Force pilot poses by a BR.20 on Chushuitzu airfield in 1938. (Photo: via the author)

M standard or relegated to second-line duties as trainers. About 250 standard BR.20's had been built by 1940, including export aircraft, and on November 1st 1939 the *Regia Aeronautica* had 148 machines in service. By June 10th 1940 the BR.20 fleet amounted to 162 aircraft serving with four *Stormi*, rather more than a third of these being BR.20M's; they were deployed as follows:

7° *Stormo* based at Lonate Pozzolo
13° *Stormo* based at Piacenza
18° *Stormo* based at Aviano
43° *Stormo* based at Cameri.

The reason for the deployment of the type in the rough terrain of Northern Italy was the general strength of the first metal-built bomber operated by the air force, and its excellent performance in turbulent air. On the eve of operations against France at the beginning of June, the *25° Gruppo* (*7° Stormo*) and *43° Gruppo* (*13° Stormo*) were already deployed on the advance fields of Ghemme and Cascina Vaga, originally designated as "restricted" bases.

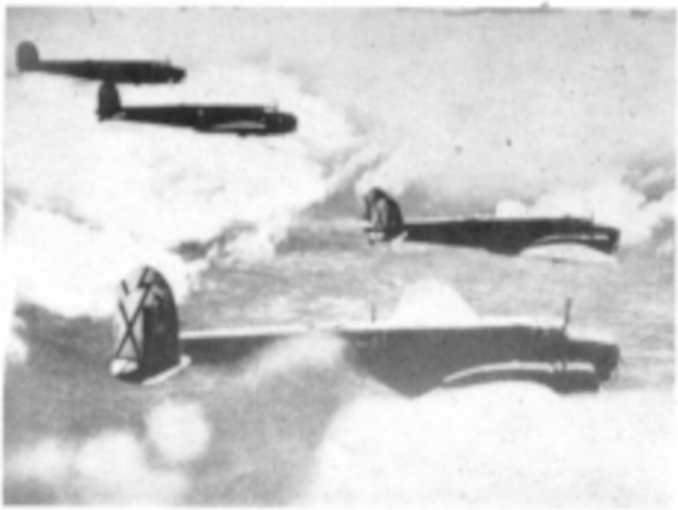
The first important action against France took place on June 13th when a force of 19 BR.20's of the *13° Stormo* attacked the bases at Fayence and Hyères. On the same day the *172° Squadriglia Ricognizione Strategica* was formed at Bresso airfield, Milan, with six Br.20's.

With the close of the French campaign the BR.20 units returned to normal training and base duties; another *Stormo* equipped with the type was brought into service in Southern Italy, the *116° Stormo* at Lecce replacing the S.M.81-equipped *56° Stormo*. In August 1940 aircraft of the *IV Divisione Aerea "Dragoe"* tested the new Borletti-Colnaghi bombsight at Lonate Pozzolo.

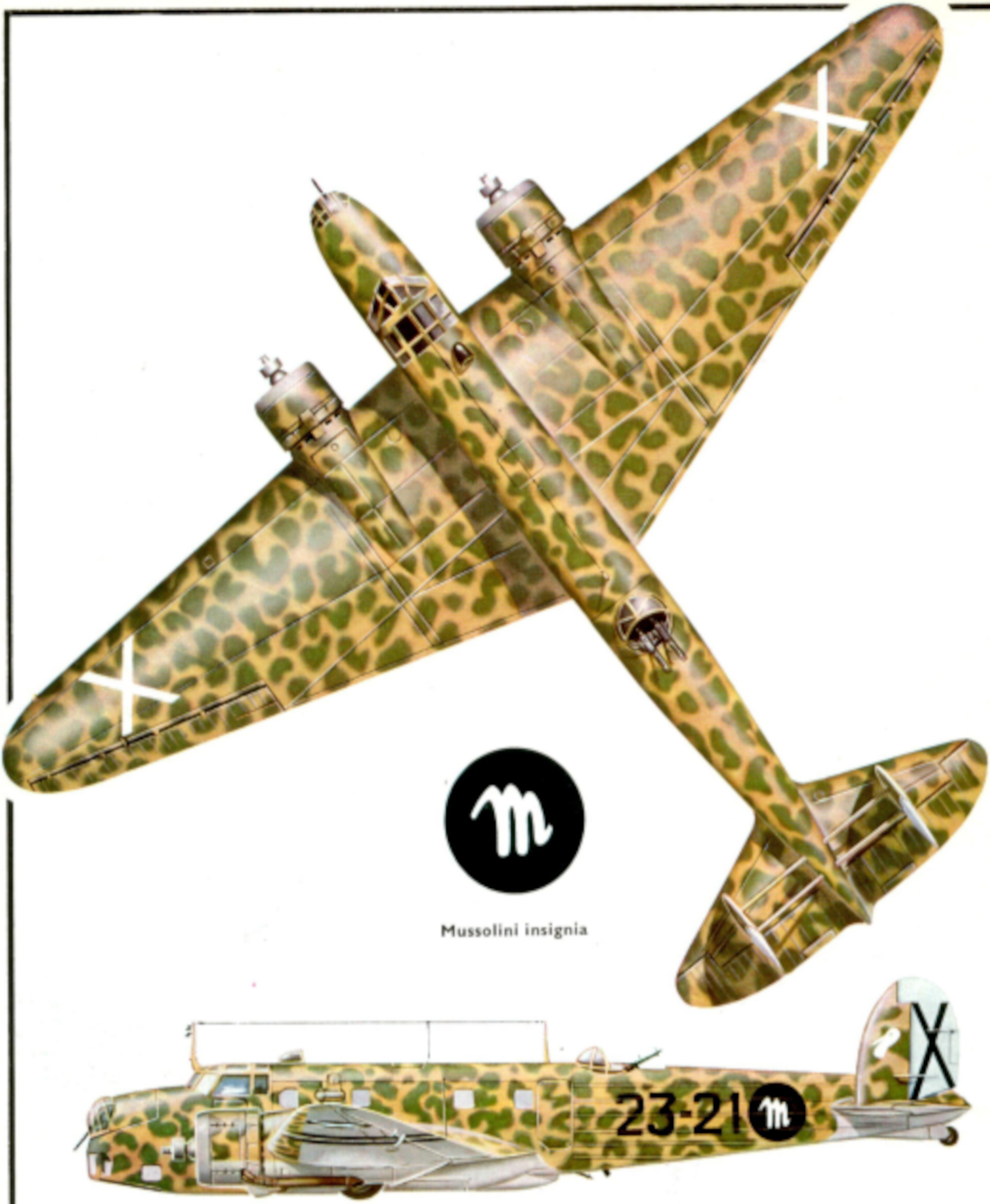
In October 1940 two of the *Stormi*, the *13°* and *43°* with a total of 80 BR.20's, were sent to Belgium as part of the *Corpo Aereo Italiano* to assist in *Luftwaffe* operations against the British Isles. The transfer flight itself was a serious undertaking, and some aircraft were lost after being forced down to emergency landings by bad weather. It became evident that the Italian crews were not particularly well trained in navigation, and the aircraft were scantily equipped for instrument flying. The *13° Stormo*, with 38 aircraft, went to Melsbroek, and the *43° Stormo* were based at Chievres.

The operations of the *Cicogna* over the British Isles between October 25th and January of the following year were not a success. On the first night raid over Harwich with sixteen aircraft, two BR.20's strayed off the return course and the crews were forced to bail out, while a third crashed just after take-off. A day attack was carried out on Ramsgate on October 29th, and another on Harwich on November 11th was hotly resisted by Hurricanes of Nos. 17, 46, 249 and 257 Squadrons R.A.F.; five of the ten BR.20's were shot down, together with a number of escorting CR.42's. Night raids on Harwich and Ipswich followed.

(continued on page 10)

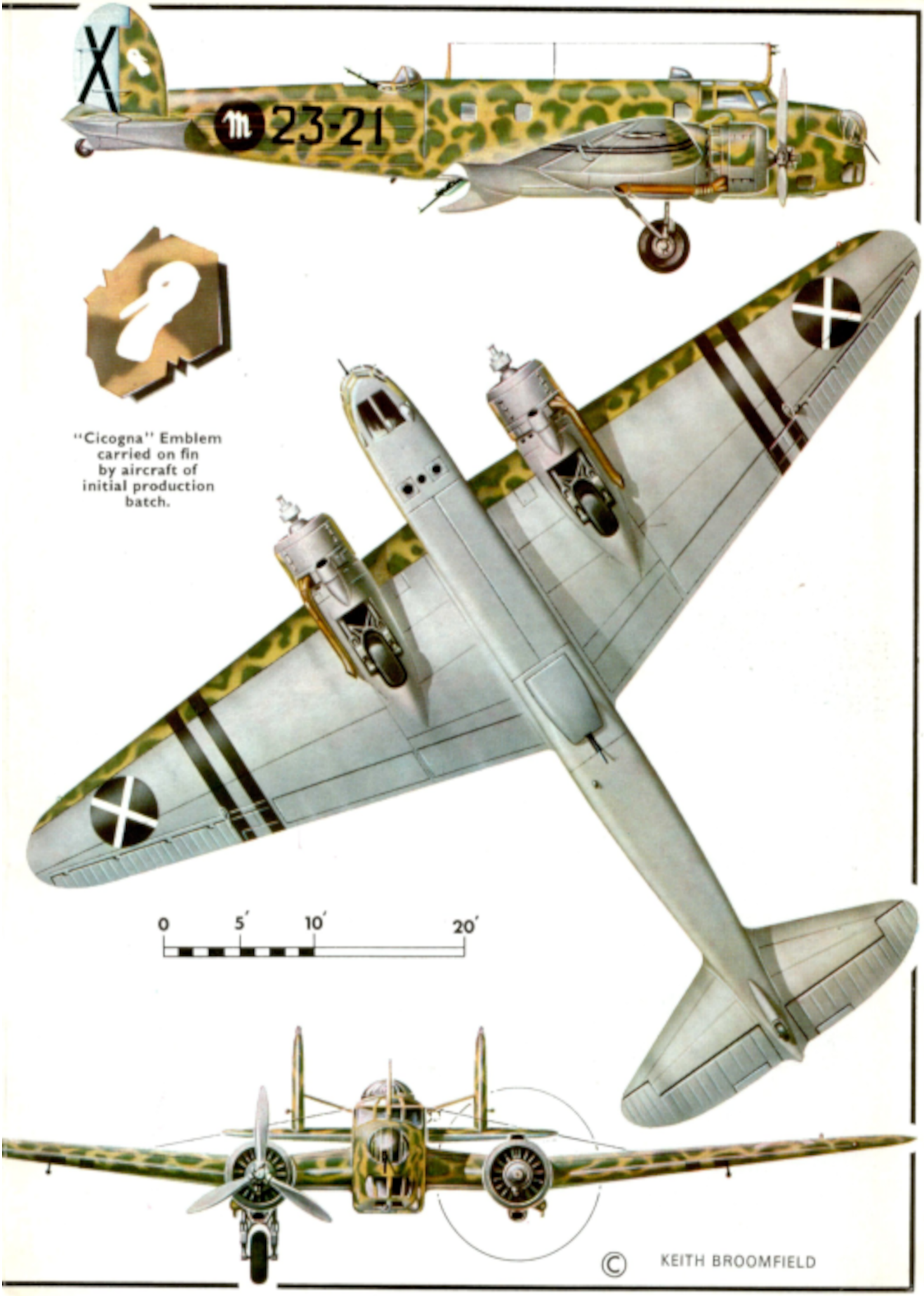


Two rare photographs of 230° Squadriglia *BR.20's over Spain.* (Photos: via Gianni Cattaneo, and the author)



Mussolini insignia

FIAT BR. 20 of 35° Gruppo, 230° Squadriglia, of the Aviazione Legionaria (Italian Air Legion), Puig Moreno, Spain, June 1938.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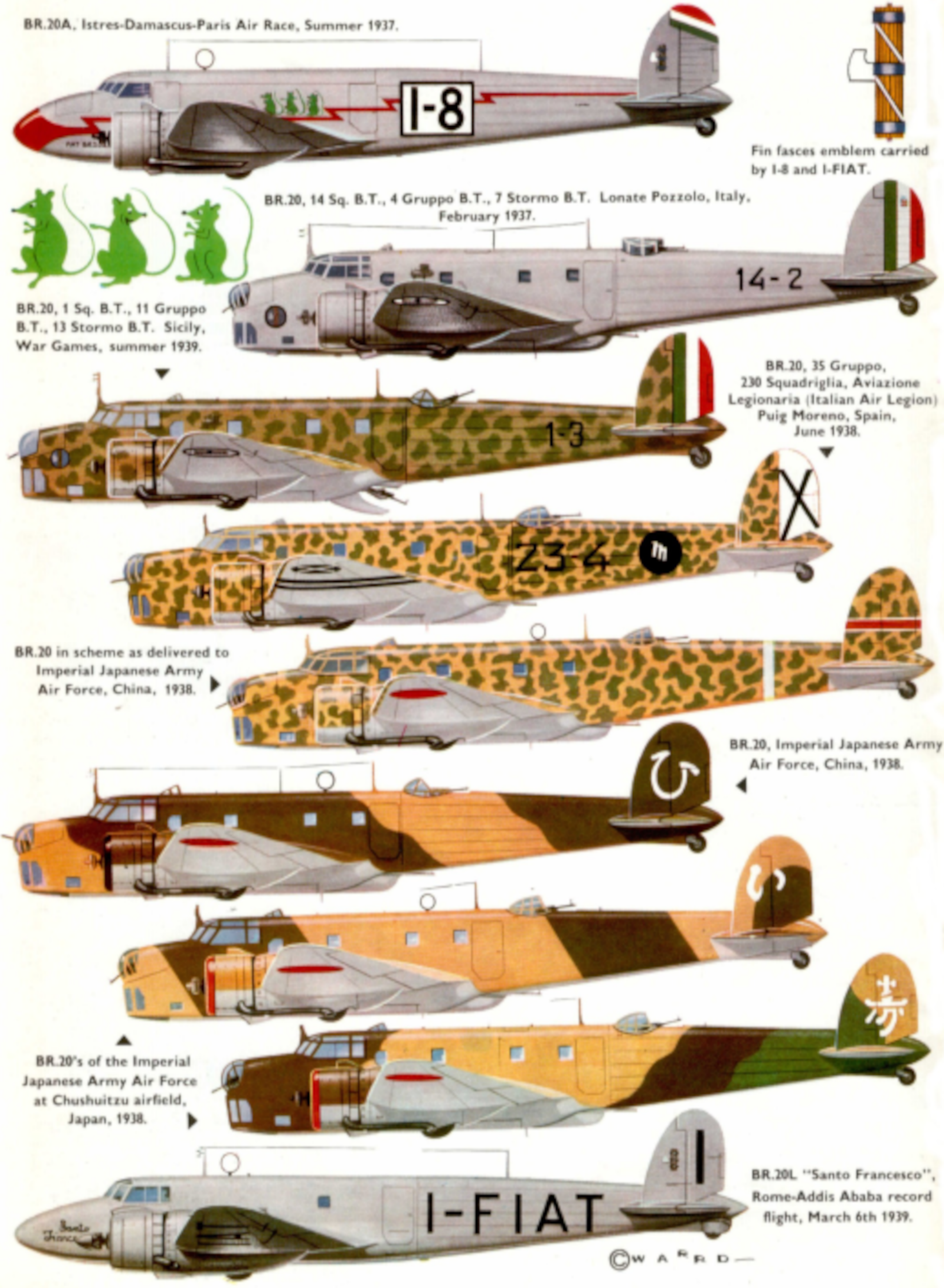
"Cicogna" Emblem carried on fin by aircraft of initial production batch.

© KEITH BROOMFIELD



BR.20A, Istres-Damascus-Paris Air Race, Summer 1937.

Fin fasces emblem carried by I-8 and I-FIAT.

BR.20, 14 Sq. B.T., 4 Gruppo B.T., 7 Stormo B.T. Lonate Pozzolo, Italy, February 1937.

BR.20, 1 Sq. B.T., 11 Gruppo B.T., 13 Stormo B.T. Sicily, War Games, summer 1939.

BR.20, 35 Gruppo, 230 Squadriglia, Aviazione Legionaria (Italian Air Legion) Puig Moreno, Spain, June 1938.

BR.20 in scheme as delivered to Imperial Japanese Army Air Force, China, 1938.

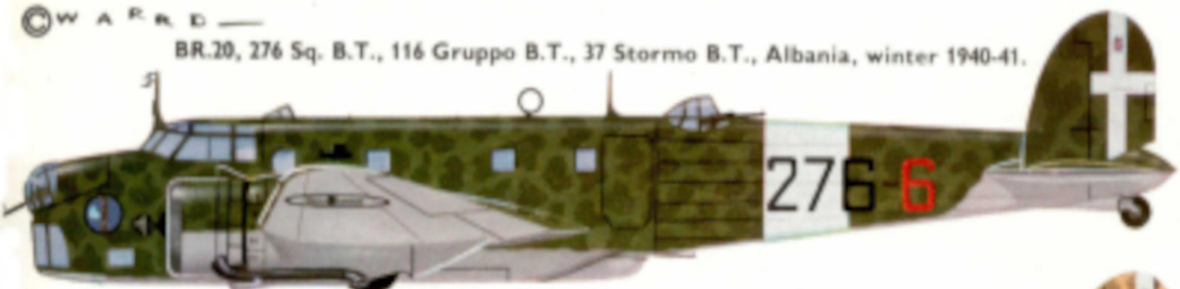
BR.20, Imperial Japanese Army Air Force, China, 1938.

BR.20's of the Imperial Japanese Army Air Force at Chushuitzu airfield, Japan, 1938.

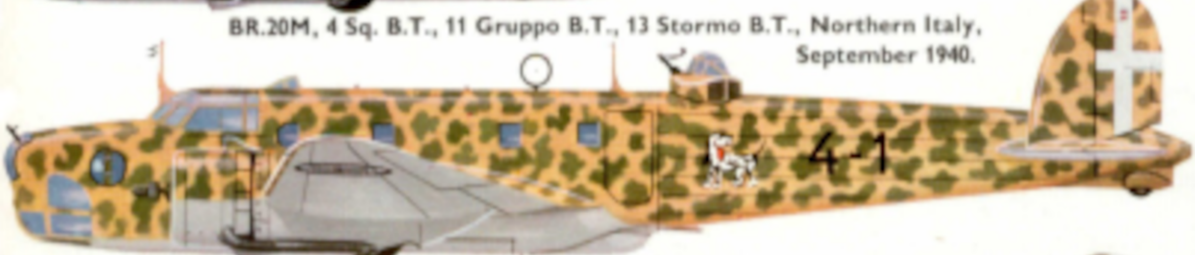
BR.20L "Santo Francesco", Rome-Addis Ababa record flight, March 6th 1939.

©WARD

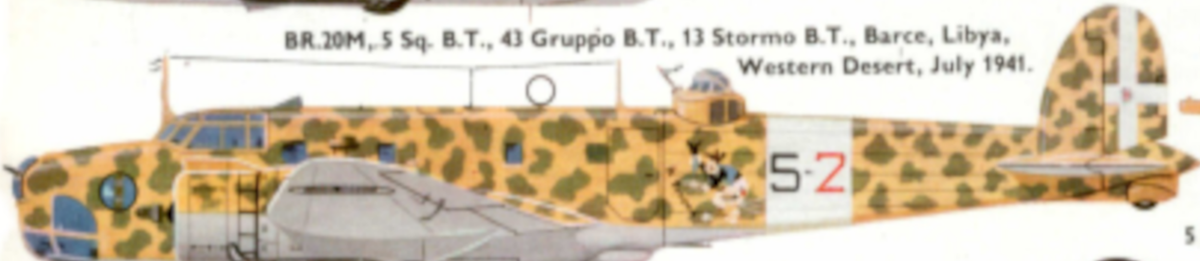
BR.20, 276 Sq. B.T., 116 Gruppo B.T., 37 Stormo B.T., Albania, winter 1940-41.



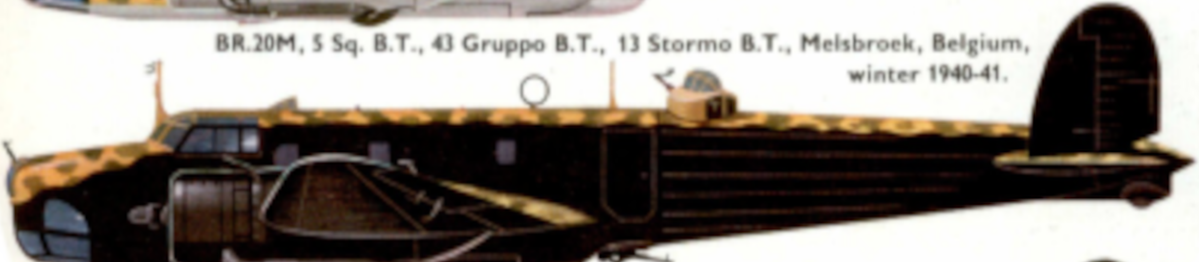
BR.20M, 4 Sq. B.T., 11 Gruppo B.T., 13 Stormo B.T., Northern Italy, September 1940.



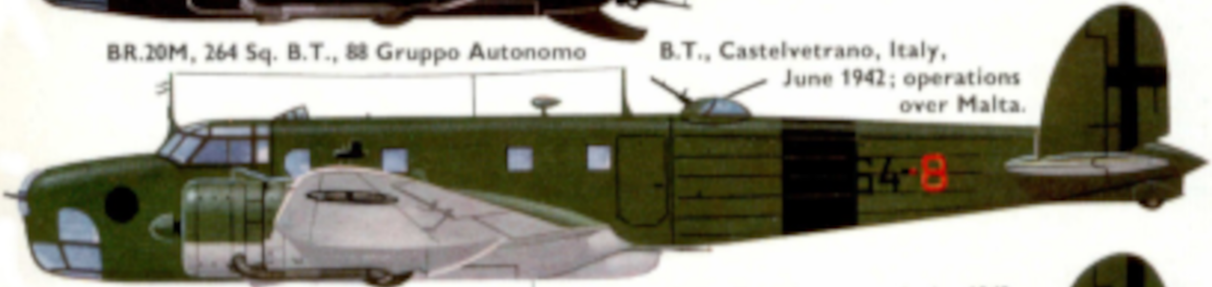
BR.20M, 5 Sq. B.T., 43 Gruppo B.T., 13 Stormo B.T., Barce, Libya, Western Desert, July 1941.



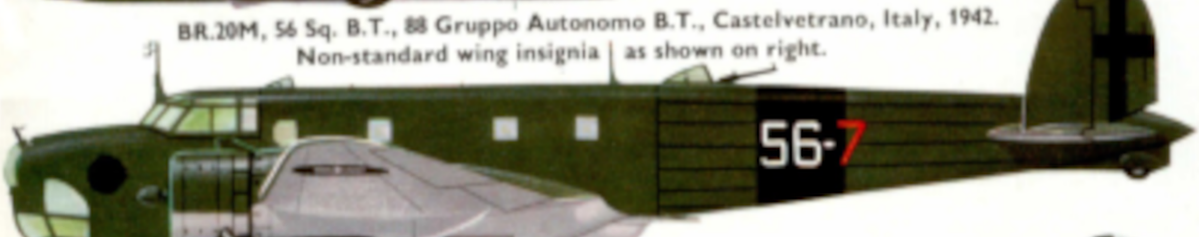
BR.20M, 5 Sq. B.T., 43 Gruppo B.T., 13 Stormo B.T., Melsbroek, Belgium, winter 1940-41.



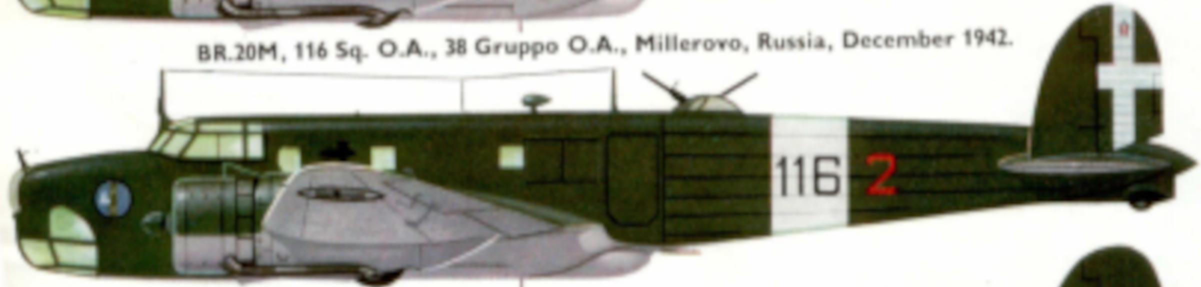
BR.20M, 264 Sq. B.T., 88 Gruppo Autonomo B.T., Castelvetrano, Italy, June 1942; operations over Malta.



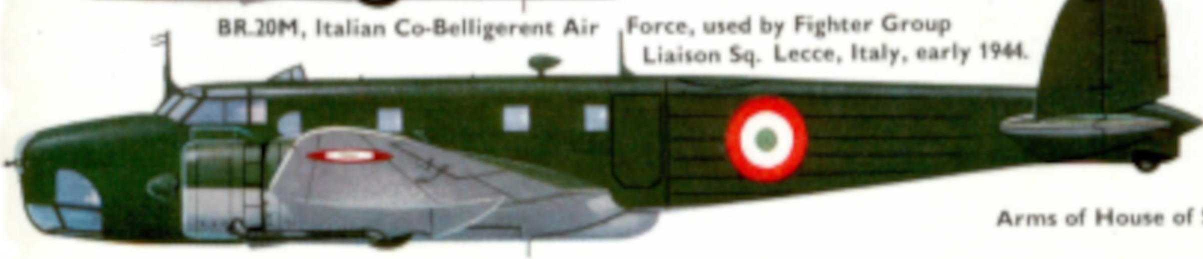
BR.20M, 56 Sq. B.T., 88 Gruppo Autonomo B.T., Castelvetrano, Italy, 1942. Non-standard wing insignia as shown on right.

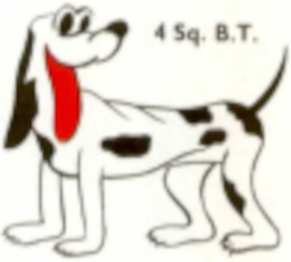


BR.20M, 116 Sq. O.A., 38 Gruppo O.A., Millerovo, Russia, December 1942.

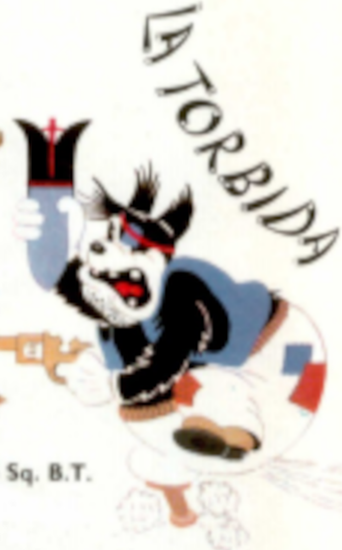


BR.20M, Italian Co-Belligerent Air Force, used by Fighter Group Liaison Sq. Lecce, Italy, early 1944.

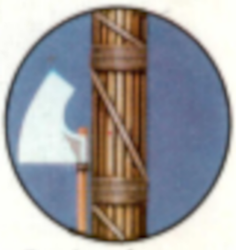




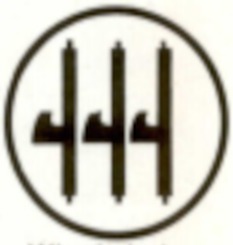
4 Sq. B.T.



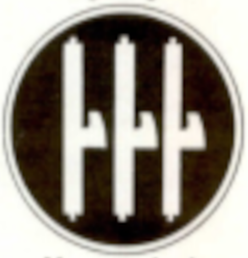
5 Sq. B.T.



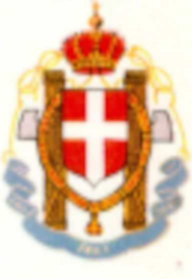
Fuselage fasces.



Wing insignia.

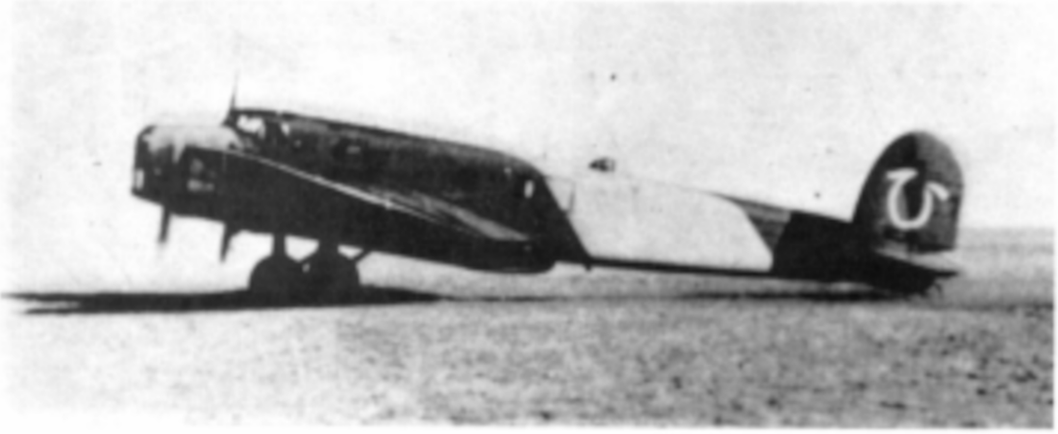


Non-standard wing insignia.



Arms of House of Savoy, rudder insignia.

J.A.A.F. Fiats in flight over Japan. (Photo: via the author)



A BR.20 in China, summer 1938. It was stated at the time that Japanese crews did not favour the type, considering it too lightly armed and vulnerable to enemy fire.
(Photo: via the author)

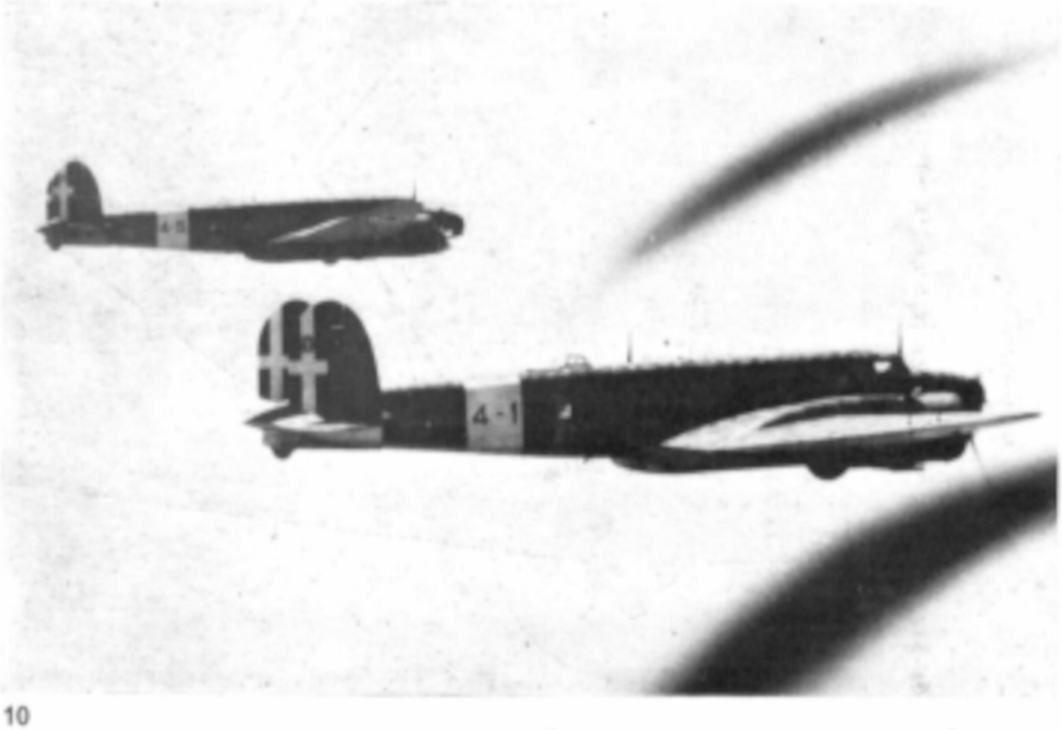
Some crews were immediately sent to instrument flying schools and a few more were trained by the *Luftwaffe* on Junkers W.34's; but the German offensive against Britain was beginning to run down, and on January 10th the *43° Stormo* came back to Lonate, the *13°* also returning to its base late in the month. Total losses of BR.20's during this short campaign were about 20 machines.

Another front opened in October 1940, and the *116° Gruppo* (*37° Stormo*) was called to attack Greek targets. The *55° Gruppo* also began to replace its S.M.81's with BR.20's with a limited use of the bigger bombers for night raids. On Greek territory the Italian bomber units were faced by British Gladiator and Hurricane fighters; and this, as well as the obsolete performance of the S.M.81, was a factor which led to the re-equipment of the *38° Stormo* in Albania with the *Cicogna*. Another unit which took part in the Greek fighting was the *37° Gruppo* (*18° Stormo*) from Grottaglie; and the veteran *13° Stormo* also took its 24 BR.20's from Piacenza to Gioia del Colle in the latter part of the campaign.

In the short offensive against Yugoslavia in April 1941, the *18° Stormo* from Aviano, the *25° Gruppo* from Forli and the *99° Gruppo* from Vicenza carried out raids against port and communications facilities. Early in the following month the *37°* and *38° Stormi* supported the conquests of Corfu, Zante, Cefalonia and other islands.

MALTA AND THE WESTERN DESERT

On February 27th 1941, the *43° Stormo* made ready to leave its base for the North African mainland; fourteen BR.20's flew from North Italy to Sciacca in Sicily on March 10th, and the next day moved on to Castel Benito in Libya, arriving eventually at a front line base, Bir Dufan. The unit was transferred to Lybia to take on night raids against British lines of supply until then carried out by the old SM.81's of the *54° Gruppo*. The *Cicogni* made several raids on Benghazi and Agedabia, sometimes accompanied by *Luftwaffe* Heinkel He 111's. The Libyan theatre was in a state of preparation for the Italo-German



BR.20M's of the 4° Squadriglia, 11° Gruppo, B.T. *on an operational mission. This unit saw action in Libya and in the abortive Italian offensive against the British Isles, launched from Belgian bases in late 1940.*
(Photo: via the author)

offensive; the *98° Gruppo* was moved from Bir Dufan to Benghazi on April 5th, and from there re-opened a night bombing offensive against the strongly-defended British fortress of Tobruk. The limited strength of this group was supplemented at the end of April by eight new BR.20's from Italy.

By the middle of 1941 the situation of the *Regia Aeronautica* was already precarious, owing to the inability of the industry to supply new equipment to the various fronts, and also to low recruitment figures. It was particularly hard to form new units at the same time as maintaining at peak efficiency those already in operation. Thus the fate of the *14° Stormo*, which returned from Libya to receive the BR.20 and remained only as a transition group for the formation of new crews.

Meanwhile Fiat were still producing the M version, and other aircraft received modifications when returned to the company for overhaul. In this way the first planes with the improved Lanciani Delta 12·7 mm. gun were produced in the second half of 1941.

In the spring of 1941 the *Cicogna* made its debut over another front: the island fortress of Malta. The *99° Gruppo* made its first sortie over Malta on May 22nd, and on June 9th the *31° Gruppo* arrived in Sicily for these operations, the unit's 18 BR.20's being based at Catania. From July 1st, the *43° Stormo* at Gerbini was integrated with *31° Gruppo*, with a combined strength of 25 BR.20M's and seven standard machines. The combined unit made their first raid on Malta on July 5th. The British fighter defence was determined, and the R.A.F. adopted a new technique of following the bombers and attacking only at some critical phase of the flight. Despite the loss of several aircraft, the BR.20's continued to operate almost nightly until October, when the *Stormo* was retired to second line duties at Galatina-Lecce. During the preceeding months in Sicily, the unit had also taken part in anti-submarine operations when necessary.

A BR.20 soon after delivery to Chushuitzu in early 1938.
(Photo: via the author)

At the end of July 1941 the veteran *98° Gruppo* moved to Castel Benito for convoy escort duties to and from Italy. The group remained in Africa until 14th December 1941 when it was transferred to Reggio Emilia air base. The *13° Stormo* were raiding Tobruk at the time of the reconquest of Cyrenaica; during the British offensive the unit moved to Misurata and only the *11° Gruppo* remained at Bir Dufan. The unit suffered heavy losses and in April 1942 was recalled to Italy to reform on the Caproni 313. In January 1942 the *43° Stormo* moved to Bresso-Milan, having returned to Italy with two *Gruppi*, the *31°* and 99°. The 98° returned from Libya, the *Stormo* was remustered on the old lines with the *98°* and *99° Gruppi*, and the *31° Gruppo* was disbanded. The *243° Sq.* of the *99° Gruppo* began operations

A BR.20M, photographed in flight from another Fiat.
(Photo: via the author)

Two views of the M-variant in flight. By the time of Italy's entry into the Second World War about one Fiat in three in Regia Aeronautica *service were BR.20M's.* (Photos: Col. Cesar Milani)

against Croatian forces, and the headquarters of the *98°* was also moved to Ronchi de Legionari. Usually the BR.20's attacked with 50/100 kg. bombs, the targets being moving infantry for the most part. The *99° Gruppo* operated from Gorizia in May and June, while the *98°* was engaged over Yugoslavia until November 1942.

The *37° Stormo* replaced the *43°* in the Malta raids but activity was limited to leave facilities available on Sicilian bases for the *Luftwaffe* units of the *II Corpo Aereo Tedesco*. Only the *55°* and *40° Gruppo* remained on the island. The *37° Stormo* was based at Lecce, again on anti-submarine and convoy patrol missions most of the time.

By this time the overhaul of the type was being carried out not only by Fiat and C.A.N.S.A. but also by Agusta (Cascina Costa), Aero Caproni (Trento) and Agusta (Tirana). Series production continued until mid-1942.

In March 1942 the *55° Gruppo* resumed operations against Malta from Castelvetrano, but following the crash of several BR.20's the unit's re-equipment with the Cant Z.1007 *bis* was urgently requested. In the same period the *88° Gruppo* was formed at Bresso with new aircraft and crews from the *43°*, with two squadrons (*264°* and *265°*), initially as part of the original *Stormo* but later established as a *Gruppo Autonomo*.

The first three BR.20's reached the Russian theatre on August 3rd 1942, with the *38° Squadriglia* of the *71° Gruppo Osservazione Aerea*, to support the operations of the Caproni 311's which were only able to carry out reconnaissance missions, while the *VIII Armata* also required low and high level bombing. Three more BR.20's from the *43° Stormo* arrived on September 5th, and five in December with the organisation of two complete *Squadriglie*, the *38°* and *116°*. The bad weather cut down the efficiency of these units, and aircraft were often compelled to take off with undercarriage and guns frozen up. Concentrated on Odessa airfield, the two *Squadriglie* were involved in the retreat of the C.S.I.R. The *116° Sq.* also operated some Ca.311's in this campaign.

In Italy at the end of 1942, the *43° Stormo* was re-equipped with the tri-motor S.M.84 while the *37°* received the Cant Z.1007*bis*. The 38° and *39° Stormi* were still operating in Albania and Yugoslavia respectively. The main use of the BR.20 at this time was coastal and convoy reconnaissance and escort. Following the decision to strengthen the units in Sicily, the *202° Sq.* was formed and operated from various bases including Palermo and Castelvetrano until April 1943. With the sole exception of the *38° Stormo*, which flew the BR.20 as a day bomber unit until the Armistice, the *Cicogna* was exclusively operated by observation units. From the end of 1942, the BR.20's of the *43° Stormo* as well as the aircraft assigned to the night fighter school at Treviso were employed in exercises with radar equipment. The Fiats played the parts of both target and interceptor, being able to simulate the flight conditions of the Dornier Do 217.

The BR.20 was also extensively used by the bombardment schools at Aviano, Ghedi, Malpensa, Jesi and Grosseto; 58 aircraft were employed by these establishments, including both standard machines and BR.20M's. A special air survey/photographic section was established at Centocelle in March 1942 and used, among other types, two BR.20's with the ventral gun position mounting four wide-angle Santoni cameras.

At the time of the Armistice only 67 BR.20's were still active, equipping the following units:

51° Sq. B.T. at Zara, with 8 serviceable machines.
69° Sq. B.T. at Scutari, with 5 serviceable machines.
38° Stormo B.T. at Tirana, with 23 serviceable machines,
21° Stormo O.A. in Dalmatia, with 8 serviceable machines,
Two *Squadriglie* in Greece, with 8 serviceable machines.

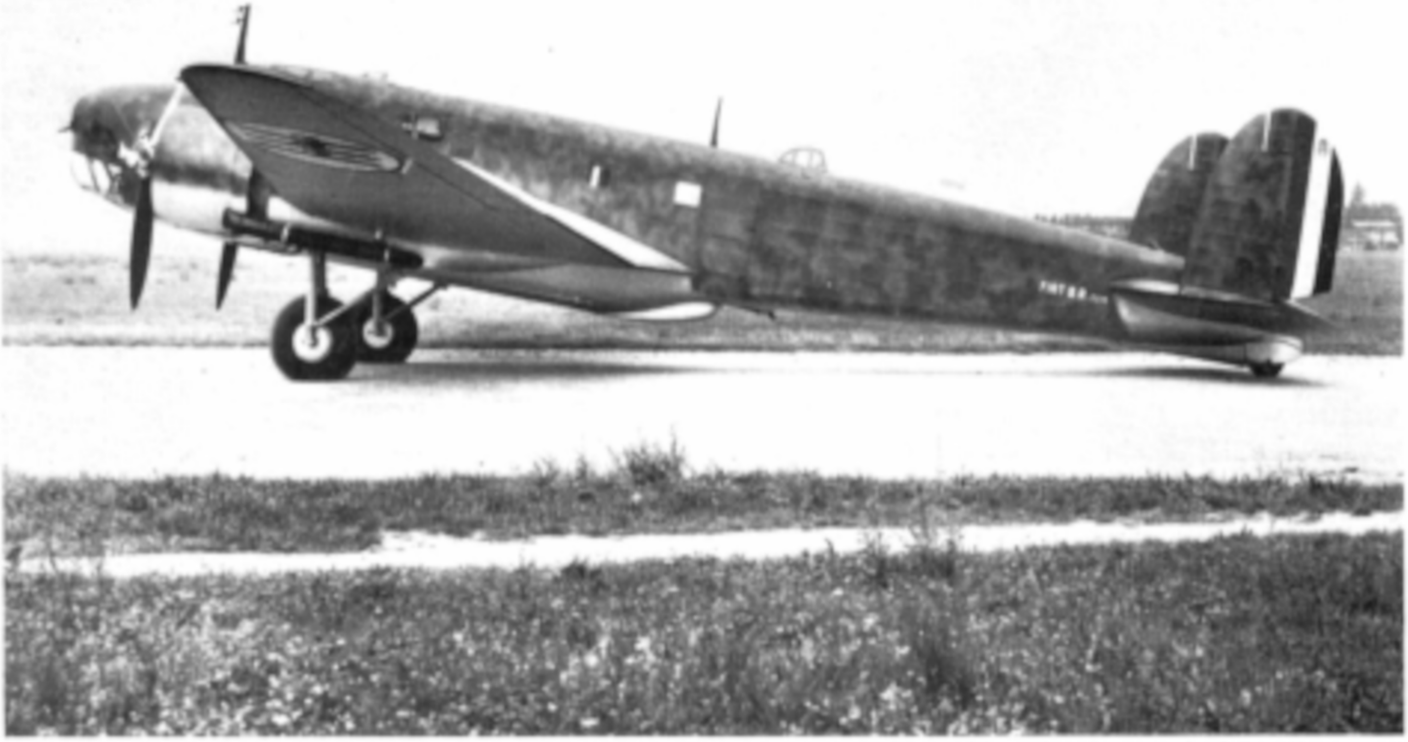
Some BR.20's were available to the *Repubblica Sociale Itàliana* but were never used. A single BR.20 remained in Southern Italy and was used by the Co-Belligerent Air Force for communications.

A total of 580 BR.20's were built, most of them BR.20M's. A few were used for various experiments; in 1942 a BR.20M was modified at Bresso to carry new radio control equipment under development by Salmoiraghi; and the Agusta factory is known at one time to have fitted one BR.20 with a tricycle landing gear, the first Italian military plane so equipped.

THE BR.20BIS

In 1943 Fiat began to produce at the Aeritalia works the BR.20*bis*, the final development of the *Cicogna* and the first to differ extensively from the 1936 prototype. The first prototype of the BR.20*bis* was tested at the end of 1940: test flights were made in Turin as well as at the *Centro Sperimentale* at Guidonia, and the second prototype flew in 1942 with 1,250 h.p. Fiat A.82-RC.32 engines, in much refined cowlings.

The BR.20*bis* had the same lines as its predecessor apart from the greatly improved fuselage aerodynamics, with a nose similar to that of the He 111, and a lengthened fuselage. The main differences were in the armament; it was increased to five machine guns. The three 12·7 mm. Safat guns, one of which was housed in a power operated dorsal turret, were supplemented by a pair of 7·7 mm. guns in two lateral blisters; and a 2,200 lb. bomb load was carried internally. Five crew members were carried and overall dimensions were a span of 71 ft. 8 in.; a length of 57 ft. 3 in., a height of 14 ft. 1 in., and a wing area of 807·292 sq. ft. Empty and loaded weights were 16,535 lb. and 25,353 lb. The BR.20*bis* had a maximum speed of 286 m.p.h. at 16,400 ft., a cruising speed of 230 m.p.h., a range of 1,242 miles and a service ceiling of 30,176 ft. The BR.20*bis* reached 13,120 ft. in 10 min. 10 sec. and 19,680 ft. in 15 minutes. While the aircraft represented a major improvement over earlier models of the *Cicogna*,



The main differences between initial production aircraft and the M-variant are easily discernible in this photograph of the M prototype
(Photo: via the author)

with better protection for the crew and aerodynamic characteristics far superior to those of the BR.20M, its series production was held up by a number of technical and circumstantial problems. In fact the *Regia Aeronautica* tried to standardize the bomber forces on two main types, the Cant Z.1007*bis* (and *ter*) and Cant Z.1018. When the BR.20*bis* went into production there was already a precarious industrial situation and it was among a number of aircraft in various stages when the Aeritalia factory suffered some heavy bombardments in Summer 1943. It seems that the *Regia Aeronautica* received only twelve or fifteen aircraft of this type, possibly delivered to *Squadriglie* which in the last part of 1943 were still equipped with the previous Fiat design.

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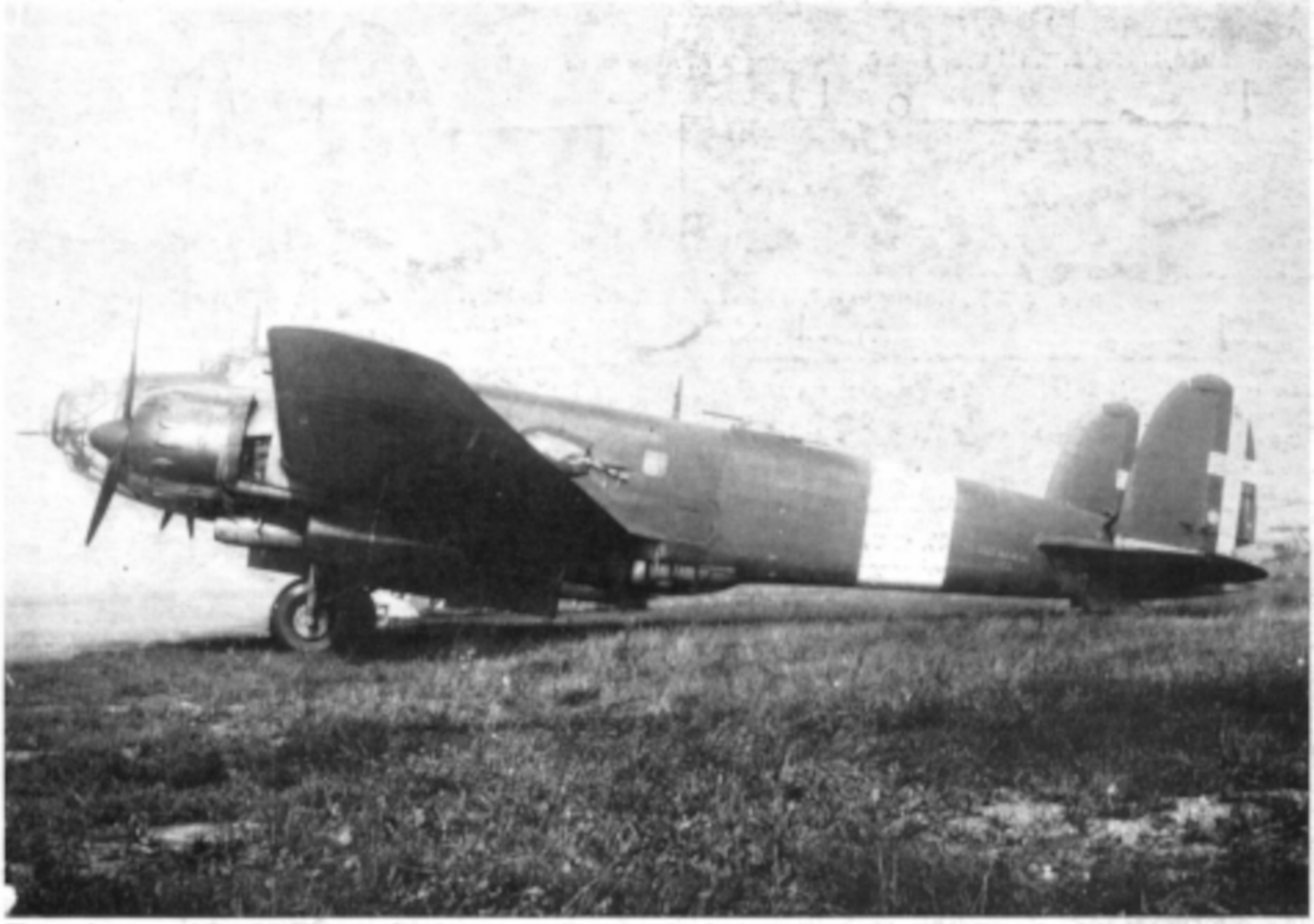
BOMBER UNITS OF REGIA AERONAUTICA EQUIPPED WITH THE B.R.20

Gruppo	**Stormo**	**Squadriglia**	**Date and location**
4°	7°	14°–15°	June 1940 Lonate Pozzolo (Italy) July 1941 Cameri (Italy)
11°	13°	1°–4°	June 1940 Piacenza (Italy) September 1940 Melsbroeck (Belgium) July 1941 Barce (Libya) April 1942 Reggio Emilia (Italy)
25°	7°	8°–9°	June 1940 Lonate Pozzolo (Italy) July 1941 Cameri (Italy)
31°	18°	65°–66°	June 1940 Aviano (Italy) May 1941 Catania (Sicily) October 1941 Lecce (Italy) January 1941 *disbanded*
37°	18°	47°–48°	June 1940 Aviano (Italy) May 1941 Catania (Sicily) then transformed into a transport unit
39°	38°	51°–69°	with S.M.81 until January 1941 Tirana (Albania)
40°	38°	202°–203°	January 1941 Shejak (Albania) November 1941 Castelvetrano (Italy)
42°	38°	200°–201°	reformed in 1943 with BR.20 (Albania)
43°	13°	3°–5°	June 1940 Piacenza September 1940 Melsbroeck (Belgium) July 1941 Barce (Libya) April 1942 Reggio Emilia (Italy)
44° & 45°	—	—	Training groups, with S.M.79, Central Italy
55°	37°	220°–221°	December 1940 Lecce (Italy) April 1941 Aviano (Italy) October 1941 Gerbini (Sicily) March 1941 Castelvetrano (Italy)



The much-improved Fiat BR.20bis, produced in very small numbers by the Aeritalia *plant in 1943. Note the nose, reminiscent of the Heinkel He 111 and He 115; the lateral gun blisters; and the A.82-RC.32 powerplants.* (Photo: via the author)

Gruppo	**Stormo**	**Squadriglia**	**Date and location**
98°	43°	240°–241°	June 1940 Cameri (Italy)
			September 1940 Chievres (Belgium)
			February 1941 Bir Dufan (Libya)
			July 1941 Castel Benito (Libya)
			April 1942 Ronchi (Italy)
99°	43°	242°–243°	April 1941 Benghazi (Libya)
			May 1941 Gerbini (Sicily)
			October 1941 Lecce (Italy)
116°	37°	276°–277°	December 1940 Lecce (Italy)
			May 1941 Gerbini (Sicily)
			BR.20 replaced by CANT Z.1007 in 1942
		Osservazione Aerea	
63° O.A.	22°	41°–113°	Yugoslavia 1942 with Ro.37 biplanes; and subsequently with Ca 311 and Ca 314
71° O.A.	22°	38°–116°	August 1942, Russia, with Ca 311

SPECIFICATION

(Data from Technical Manual CA.273 of the *Ministero dell'Aeronautica*, issued 1937, applicable to the first production series).

Powerplant: Two FIAT A.80 RC.41, double row, nine cylinder engines, rated at 1,000 h.p. each at 2,100 r.p.m. at 13,450 ft. Three-blade constant speed Fiat propellers, 11 ft. 7 in. diameter.

Dimensions: Wing span 70 ft. 8 in.; length 52 ft. 9 in.; height 14 ft. 1 in.; medium wing chord 12 ft. 5 in.; wing area 796·5 sq. ft.

Weights: Empty 14,330 lb.; useful load (normal) 7,936 lb. of which: crew (4 men) 705 lb.; fuel 3,790 lb.; oil 330 lb.; bombs 2,204 lb.; guns 405 lb.; radio equipment etc. 422 lb.; loaded weight 22,266 lb.; wing loading 27·64 lb./sq. ft.; power loading 12·12 lb./h.p.

Performance: with 7,936 lb. load.

Max. speed at sea level	204 m.p.h. at 2,090 r.p.m.
6,560 ft.	245 m.p.h. at 2,025 r.p.m.
9,840 ft.	256 m.p.h. at 2,120 r.p.m.
13,120 ft.	267 m.p.h. at 2,205 r.p.m.
16,400 ft.	262 m.p.h. at 2,200 r.p.m.
19,680 ft.	239 m.p.h. at 2,115 r.p.m.

Stalling speed 68 m.p.h. at 1,900 r.p.m.

climb to 3,280 ft. in 3 min. 35 sec.
6,560 ft. in 6 min. 50 sec.
9,840 ft. in 9 min. 58 sec.
13,120 ft. in 13 min. 37 sec.
16,400 ft. in 17 min. 56 sec.
19,680 ft. in 25 min. 30 sec.

Take-off run, 1,150 ft.; landing run with brakes 660 ft.; service ceiling 24,935 ft.; endurance at 16,400 ft. and 217 m.p.h., 5 hours and 30 minutes.

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